

REMARKS

Claims 1-24 are pending in the application. Claims 23 and 24 have been amended for clarification purposes. Reconsideration of the application is respectfully requested for the following reasons.

The Office Action rejected claims 23 and 24 under 35 U.S.C. § 112, second paragraph, on grounds that the steps of the method recited in these claims is unclear. These claims are also the subject of a rejection under 35 U.S.C. § 101 for being directed to non-statutory subject matter (e.g., the Examiner has taken the position that it is unclear whether claims 23 and 24 cover a method or apparatus.) Claims 23 and 24 have been amended to more clearly recite the steps of the method defined in these claims. It is respectfully submitted that these amendments are sufficient to overcome the § 112 and § 101 rejections.

The Office Action rejected claims 16-19 and 22-24 under 35 U.S.C. § 102(e) as being anticipated by Jung et al. (hereinafter "Jung"), U.S. Patent No. 6,389,554. Applicant respectfully traverses the rejection.

Initially, it is noted that claim 16 depends from independent claim 5, which has not been rejected under 35 U.S.C. § 102 based on Jung. The rejection of claim 16 is therefore improper and should be withdrawn.

Claim 17 recites broadly the embodiments of the invention disclosed in the specification. In particular, this claim recites "a C-channel interconnecting the C-channel controllers of the first and second devices to convey status signals." The Jung patent does not disclose this feature.

The Jung patent discloses a fault tolerance system that includes a data channel between an active module and standby module. (See Fig. 3). However, no C-channel is disclosed, i.e., Jung does not disclose a channel which conveys status signals for performing a duplexing operation between its active and standby modules. See Figs. 3 and 5 where only the data channel is located between the modules.

In rejecting claim 17, the Examiner relied on column 7, lines 51-58, of Jung for a disclosure of the C-channel and C-channel controllers recited in claim 17. This portion of Jung discloses that a memory switch controller 440 (Fig. 6) generates signals for controlling three switches 410, 420 and 430 (Fig. 5) for conveying data between the two modules over the data channel. Unlike the claimed invention, the data channel only carries data between memories 110 located in each of the modules. Jung does not disclose that this channel carries status signals between the modules and therefore this channel cannot be said to correspond to the C-channel of claim 17.

The Examiner also drew a correspondence between the status signals of the claimed invention and the enable and direction signals (e.g., "Enable_A," "Dir_A," etc.) in Fig. 5. However, the Jung patent does not disclose that these signals are status signals used for performing a duplexing operation between the modules, i.e., Jung does not disclose that its data channel carries a "self-side normal signal" and a "pair-side active signal" which indicate an operational status of the modules. Rather, Jung expressly discloses that these signals are generated by controller 440 to control switches 410, 420, and 430 for the purpose of conveying data between the modules over the data channel.

Claim 17 also recites that the first and second devices include a C-channel controllers, each of which monitors a subset of the C-channel status signals to determine which of the first and second devices has an active mode status and which has a standby mode status. The Jung patent does not include controllers of this type. More specifically, each of the modules in Jung includes a controller 440. However, this controller does not generate status signals of the type recited in claim 17. Rather, these signals are used to control the conveyance of data over the data channel, specifically by controlling the switching of internal switches 410, 420, as Jung.

Without a disclosure of a C-channel and C-channel controllers, the Jung patent cannot anticipate claim 17. Applicant further submits that these differences are sufficient to render claim 17 and its dependent claims non-obvious and thus patentable over Jung.

Claim 18 recites an active status “identified by a true state existing on the self-side normal signal and a false state existing on the pair-side active signal.” Jung does not disclose these features. More specifically, as previously discussed Jung discloses generating signals (“Enable_A”, “Dir_A”, “Enable_B”, “Dir_B”, “Enable_C”, and “Dir_C”) for controlling the internal data channel switches 410-430. However, none of these signals includes a “self-side normal signal” or a “pair-side active signal” as recited in claim 18. Applicant submits that claim 18 is allowable based on these additional differences.

Claim 22 recites reading a first status of a first device and a second status of a second device, and then “setting one of the first and second devices to an active mode status and the other of the respective devices to a standby mode status based on the first and second

status, wherein both the first status and the second status are identified by a self-side normal signal and a pair-side active signal.” The Jung patent does not disclose these features.

As previously discussed, Jung discloses a controller 440 that generates enable and direction signals (Enable-A, etc.) for controlling switches 410, 420 and 430. These switches are controlled for the purpose of sending data between memories 110 in the modules. None of the enable and direction signals, however, include a “pair-side active signal” as recited in claim 22, e.g., a signal from the other module indicating an operational status of the other module. Without a disclosure of such a feature, the Jung patent cannot anticipate claim 22 or any of its dependent claims.

Claim 23 recites identifying the active mode status by a true state existing on the self-side normal signal and a false state existing on the pair-side active signal, and identifying the standby mode status is identified by other combinations of the true and false states existing on the self-side normal and pair-side active signals. The Jung patent fails to disclose at least a pair-side active signal and thus cannot anticipate the invention defined in claim 23.

Claim 24 recites “interconnecting a C-channel to the C-channel controllers of the first and second devices to convey the first and second status between the first and second C-channel controllers.” The Jung patent only discloses a data channel between its modules. Jung does not disclose the C-channel and C-channel controllers recited in claim 24. Accordingly, Jung cannot anticipate this claim.

The Office Action rejected claims 1-3, 5, and 7-24 under 35 U.S.C. § 102(e) for being anticipated by the Chan publication. Applicant respectfully traverses this rejection for the following reasons.

Claim 1 also recites broadly the embodiments of the invention disclosed in the specification. In particular, this claim recites “a C-channel that exchanges the primary and secondary status information between the primary and secondary C-channel controllers to support duplexing logic between the active module and the standby module.” The Chan publication does not disclose these features.

Chan discloses a controller for managing transfer of data between a host computer system and a peripheral device. The controller includes a first control logic unit and a second control logic unit. (See Fig. 3) In operation, one control logic unit is activated to control data flow between the host and peripheral where the other logic unit malfunctions.

To coordinate data flow between the logic units, the Chan publication discloses that sideband signals 214 are conveyed between the control logic units. Unlike claim 1, however, these signals do not include “primary and secondary status information . . . which are used to support duplexing logic between active and standby modules.” (Emphasis added). Rather, sideband signals 214 are bus request and grant signals (see paragraph [0044], last four lines) relating to the use of internal busses 230A and 230 in the control logic units. Since these busses carry data to and from internal memories 234A and 234B, it is clearly evident that the sideband signals are used for the purpose of controlling the flow of data between memories

234A and 234B in the control logic units 212A and 212B, and thus do not constitute the primary and second status information used for performing duplexing as recited in claim 1.

Moreover, it is further noted that the bus request and grant signals 214 of Chan are similar to the type of signals conveyed in the related art system of Fig. 1 of Applicant's drawings, which is one of the systems Applicant's invention represents a significant improvement over.

Because the Chan publication does not disclose all the features in claim 1, it is respectfully submitted that Chan cannot anticipate this claim. Applicant further submits that these differences are sufficient to render claim 1 and its dependent claims non-obvious and thus patentable over Chan.

Claim 5 also recites broadly the embodiments of the invention disclosed in the specification. In particular, this claim recites "reading a secondary status of a secondary module, via a C-channel, with a primary module." The Chan publication does not disclose a C-channel of this type, or any of the other features recited in claim 5 generated by and conveyed through the C-channel controllers for performing a duplexing operation. Without a disclosure of these features, the Chan publication cannot anticipate claim 5 or any of its dependent claims.

Claim 17 recites broadly the embodiments of the invention disclosed in the specification. In particular, this claim recites "a C-channel interconnecting the C-channel controller of the first and second devices to convey status signals, wherein the C-channel controller of the first and second devices each monitor a self-side of the C-channel status

signals to determine which of the first and second devices has an active mode status and which has a standby mode status.” The Chan publication does not disclose the C-channel and C-channel controllers recited in this claim and thus cannot anticipate claim 17 or any of its dependent claims.

Claim 22 recites broadly the embodiments of the invention disclosed in the specification. In particular, this claim recites setting one of the first and second devices to an active mode status and the other of the respective devices to a standby mode status based on the first and second status, wherein both the first status and second status are identified by a self-side normal signal and a pair-side active signal. None of the sideband signals 214 sent between the control logic units 212A and 212B include a pair-side active signal such as recited in claim 22. Without this feature, the Chan system cannot perform the setting step of claim 22 and thus cannot anticipate this claim.

Claim 23 recites “identifying the active mode status by a true state existing on the self-side normal signal and a false state existing on the pair-side active signal.” The Chan publication does not disclose a pair-side active signal and thus cannot anticipate claim 23.

The Office Action rejects claims 1-3 and 5 under 35 U.S.C. § 103(a) for being obvious over Jung in view of standard PCI bus master practice, and further in view of Hammersley. Applicant respectfully traverses the rejection for the following reasons.

The Hammersley patent discloses managing a PCI bus using a CPU. However, Hammersley does not teach or suggest the features of claim 1 missing from Jung, e.g., a C-channel that exchanges the primary and secondary status information between the primary

and secondary C-channel controllers to support duplexing logic between the active module and the standby module. These features are also not taught, suggested, or otherwise performed in standard PCI bus master practice.

Without these features, it is respectfully submitted that the combination of Jung, standard PCI bus master practice, and Hammersley cannot render obvious claim 1 or any of its dependent claims. Accordingly, withdrawal of the § 103(a) rejection and allowance of claim 1 is respectfully requested.

Claim 5 recites “reading a secondary status of a secondary module, via a C-channel, with a primary module.” Neither Hammersley nor standard PCI bus master practice teaches or suggests the C-channel of this claim. Nor do these references teach or suggest the other features of claim 5 missing from Jung, e.g., the features generated by and conveyed through the C-channel controllers for performing a duplexing operation.

The Office Action rejects claims 20 and 21 under 35 U.S.C. § 103(a) for being obvious over Jung in view of standard PCI bus master practice, further in view of Hammersley. Applicant respectfully traverses the rejection for the following reasons.

Claims 20 and 21 ultimately depend from claim 17, which recites “a C-channel interconnecting the C-channel controllers of the first and second devices to convey status signals.” Neither this C-channel nor any of its associated features recited in claim 17 are taught or suggested by the Hammersley patent or standard PCI bus master practice.

Claims 20 and 21 further depend from claim 18, which recites an active status “identified by a true state existing on the self-side normal signal and a false state existing on

the pair-side active signal.” As discussed above, the Jung patent does not teach or suggest conveying status signals along a C-channel and between the C-channel controllers which include “self-side normal signals” and the “pair-side active signals” and the Hammersley patent and standard PCI bus master practice are also deficient in this respect.

Based on at least these differences, it is respectfully submitted that claims 20 and 21 are non-obvious and thus patentable over a Jung- standard PCI bus master practice-Hammersley combination.

The Office Action rejects claims 4 and 6 under 35 U.S.C. § 103(a) for being obvious over Jung in view of standard PCI bus master practice, further in view of Shaffer. Applicant respectfully traverses this rejection for the following reasons.

Claim 4 depends from claim 1. In order to render claim 4 obvious, the Shaffer patent must therefore teach or suggest the features of claim 1 missing from the Jung patent and standard PCI bus master practice.

The Shaffer patent discloses a system for performing bus arbitration to control the access of multiple devices to a common bus based on priority levels. See column 3, lines 14-28. However, Shaffer does not teach or suggest a C-channel that conveys primary and secondary status information used to support duplexing logic between active and standby modules as recited in claim 1. Shaffer also does not teach or suggest the C-channel controllers recited in claim 1.

Without a teaching or suggestion of these features, it is respectfully submitted that claim 4 cannot be rendered obvious by any combination formed among the Jung and Shaffer patents and standard PCI bus master practice. And it is also noted that Shaffer fails to teach or suggest the features of claim 2, from which claim 4 also depends.

Claim 6 depends from claim 5, which recites "reading a secondary status of a secondary module, via a C-channel, with a primary module." The Shaffer patent does not teach or suggest this C-channel or any of the information conveyed over this channel. Shaffer also fails to teach or suggest the information and signals generated by and conveyed through the C-channel controllers for performing a duplexing operation.

Without a teaching or suggestion of these features, it is respectfully submitted that claim 6 cannot be rendered obvious any combination formed among the Jung and Shaffer patents and standard PCI bus master practice.

The Office Action rejects claims 4 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Chan in view of standard PCI bus master practice, further in view of Shaffer. Applicant respectfully traverses this rejection for the following reasons.

From the foregoing discussion, it is apparent that the Chan patent fails to teach or suggest essentially the same features of claims 1 and 5 that are missing from the Jung patent. The Shaffer patent does not supply these features. Accordingly, it is respectfully submitted that claims 4 and 6 are allowable over the cited combination at least by virtue of their respective dependencies from claims 1 and 5.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, Daniel Y.J. Kim, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

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